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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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09/940,638

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Takahiro Nakayama

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EXAMINER

HOGANS, DAVID L

ART UNIT

PAPER NUMBER

2813

DATE MAILED: 09/07/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/940,638

Applicant(s)

NAKAYAMA ET AL.

Examiner

David L. Hogans

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 8-04-04.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☐ Claim(s) 1,3-6 and 8-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,3-6 and 8-20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 29 August 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- 1) ☒ Certified copies of the priority documents have been received.
 - 2) ☐ Certified copies of the priority documents have been received in Application No. _____.
 - 3) ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

This Office Action is in response to the Request for Continued Examination filed on August 4, 2004.

Status of Claims

Claims 1, 3-6 and 8-12 are pending. Claims 13-20 are newly added.

Claim Rejections - 35 USC § 112

1. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

2. Claims 15-16 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. For instance, the specification and drawings fail to teach wherein the light-emitting molecule is directly surrounded by the spin conversion material.

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 13-20 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claims 13 and 14 claim the spin conversion material as the "main material". The Examiner is uncertain as to how the spin conversion

material can be the main material, when according to Claim 1, both the spin conversion material and the light-emitting molecule, are each an independent dopant. As to Claims 15 and 16, the Examiner is uncertain as to how the light-emitting molecule is surrounded by the spin conversion material, when according to Claim 1, both the spin conversion material and the light-emitting molecule, are each an independent dopant. As to Claims 17-20, the Examiner is uncertain as to how the light-emitting layer consists of/consists essentially of the light-emitting molecule and the spin conversion material, when according to Claim 1, both the spin conversion material and the light-emitting molecule, are each an independent dopant.

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

1. Claims 1, 3-6, 8-16 and 19-20 are rejected under 35 U.S.C. 102(e) as being anticipated by 6,310,360 to Forrest et al.

In reference to Claims 1, 3, 6, 8, 11 and 12, Forrest et al. teaches:

- an electroluminescent film device with a light-emitting layer where an excited state generated by electron hole recombination is utilized for photon generation (See columns 9-19 lines 01-20)
- a spin conversion material in which the quantum number of orbital angular momentum and the quantum number of excited state spin are convertible into each other by their interaction and wherein the material is a molecule in which a heavy metal atom is bonded to or coordinated to an organic material (Ir(ppy)_3); and (See column 9 lines 17-65 and columns 12-15 lines 59-20 and Figure 1)
- a light-emitting molecule (DCM2) mixed into the spin conversion material; each as an independent dopant (See column 9 lines 17-65 and columns 12-15 lines 59-20 and Figure 1)

The Examiner notes that the limitation wherein the light-emitting layer is an organic film formed by simultaneous vapor deposition, in Claims 6, 11 and 12, is a processing limitation and, therefore, carries no weight in a claim drawn to a device.

"Even though product -by[-] process claims are limited by and defined by the process, determination of patentability is based upon the product itself. The patentability of a product does not depend on its method of production. If the product in product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product is made by a different process." *In re Thorpe*, 227 USPQ 964, 966 (Fed. Cir. 1985)(citations omitted).

A "*product by process*" claim is directed to the product per se, no matter how actually made, *In re Hirao and Sato et al.*, 190 USPQ 15 at 17 (CCPA 1976) (footnote 3). See also *In re Brown and Saffer*, 173 USPQ 685 (CCPA 1972); *In re Luck and Gainer*, 177 USPQ 523 (CCPA 1973); *In re Fessmann*, 180 USPQ 324 (CCPA 1974); and *In re Marosi et al.*, 218 USPQ 289 (CAFC 1983) final product per se which must be determined in a "*product by, all of*" claim, and not the patentability of the process, and that an old or obvious product, whether claimed in "*product by process*" claims or not. Note that Applicant has the burden of proof in such cases, as the above caselaw makes clear.

In reference to Claims 4, 5, 9 and 10, Forrest et al. teaches:

- incorporating all arguments of Claims 1 and 6 and noting that Forrest et al. teaches wherein the light-emitting molecule (PtOEP) is a molecule in which a heavy metal atom (Pt) is bonded or coordinated to an organic material (See column 15 lines 25-60)

The Examiner notes that column 15 lines 25-60 teaches an intersystem crossing agent (ISC) comprised by benzil or other ISC agents. The Examiner also notes that column 9 lines 17-36 teaches that ISC agents may be comprised by Ir(ppy)₃ or other metals of the third row of the periodic table coupled to organometallic compounds.

In reference to Claims 13 and 14, Forrest et al. teaches (as best understood):

- wherein the light-emitting layer contains the spin conversion material as a main material (noting Examples 1 and 2 teach wherein the spin conversion material comprises between 10-15% of the light-emitting layer) (See columns 9-19 lines 01-20)

In reference to Claims 19 and 20, Forrest et al. teaches (as best understood):

- wherein the light-emitting layer consists essentially of the light-emitting molecule and the spin conversion material (noting the host material CBP does not materially alter or effect the properties of the light-emitting layer – See MPEP § 2111.03)(See columns 9-19 lines 01-20)

2. Claims 1, 3-6, 8-10 and 13-20 are rejected under 35 U.S.C. 102(e) as being anticipated by 6,303,238 to Thompson et al.

In reference to Claims 1, 3-6 and 8-10, Thompson et al. teaches:

- an electroluminescent film device with a light-emitting layer where an excited state generated by electron hole recombination is utilized for photon generation (See columns 5-9 lines 01-50)
- a spin conversion material in which the quantum number of orbital angular momentum and the quantum number of excited state spin are convertible into each other by their interaction and wherein the material is a molecule in which a

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heavy metal atom is bonded to or coordinated to an organic material (wherein M of patent 6,358,631, noting columns 6-7, is either a +3 or a +2 metal); and (See columns 5-9 lines 01-50)

- a light-emitting molecule (PtOEP) mixed into the spin conversion material; each as an independent dopant (See columns 5-9 lines 01-50)

The Examiner notes that 6,303,238 incorporates application number 08/693,359 (now Patent No. 6,358,631). Application number 08/693,359 teaches wherein a host compound/spin conversion material is comprised by a +3 or +2 metal. Additionally, it is noted that Iridium is commonly a +3 metal and Platinum is commonly a +2 metal.

The Examiner notes that the limitation wherein the light-emitting layer is an organic film formed by simultaneous vapor deposition, in Claims 6, 11 and 12, is a processing limitation and, therefore, carries no weight in a claim drawn to a device.

"Even though product -by[-] process claims are limited by and defined by the process, determination of patentability is based upon the product itself. The patentability of a product does not depend on its method of production. If the product in product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product is made by a different process." *In re Thorpe*, 227 USPQ 964, 966 (Fed. Cir. 1985)(citations omitted).

A "*product by process*" claim is directed to the product per se, no matter how actually made, *In re Hirao and Sato et al.*, 190 USPQ 15 at 17 (CCPA 1976) (footnote 3). See also *In re Brown and Saffer*, 173 USPQ 685 (CCPA 1972); *In re Luck and Gainer*, 177 USPQ 523 (CCPA 1973); *In re Fessmann*, 180 USPQ 324 (CCPA 1974); and *In re Marosi et al.*, 218 USPQ 289 (CAFC 1983) final product per se which must be determined in a "*product by, all of*" claim, and not the patentability of the process, and that an old or obvious product, whether claimed in "*product by process*" claims or not. Note that Applicant has the burden of proof in such cases, as the above caselaw makes clear.

In reference to Claims 13 and 14, Thompson et al. teaches (as best understood):

- wherein the light-emitting layer contains the spin conversion material as a main material (noting the dopant comprises 0.01 to 10 mole% of the emitting layer)(See columns 5-9 lines 01-50)

In reference to Claims 15 and 16, Thompson et al. teaches (as best understood):

- wherein the light-emitting molecule (i.e. – the dopant) is directly surrounded by the spin conversion material (See columns 5-9 lines 01-50)

In reference to Claims 17-20, Thompson et al. teaches (as best understood):

- wherein the light-emitting layer consists of/consists essentially of the light-emitting molecule and the spin conversion material (See columns 5-9 lines 01-50)

Response to Arguments

3. Applicant's arguments filed August 4, 2004, have been fully considered but they are not persuasive. The new argument of record proposed by Applicant is that Forrest et al. teaches "nothing more than an allegation of 'obvious to try'". As to this argument, the Examiner refers the Applicant to MPEP § 2123, which teaches that cited prior art is relevant for all that it contains. Since Forrest et al. teaches mixing an ISC agent/spin conversion material with a heavy metal atom, and a light-emitting molecule, it meets the metes and bounds of Applicant's Claims 1 and 6. As all other arguments have been previously presented, the Examiner refers Applicant to the Final Rejection mailed on May 4, 2004.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to David L. Hogans whose telephone number is (571) 272-1691. The examiner can normally be reached on M-F (7:30-4:30).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Carl Whitehead Jr. can be reached on (571) 272-1702. The fax phone

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number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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